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Climate Change - Organizing the ScieNce for the American CORDillera
Cambio Climático - Organizando la CieNcia para la CORDillera Americana

RESÚMENES
Simposio sobre Cambio Climático:
Organizando la Ciencia para la Cordillera Americana
Incluyendo Resúmenes de IAI-CRNII-047 y UNESCO-IHP

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Organizing the Science in the American Cordillera
ABSTRACTS
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Applications of Dendroclimatology to Water Resources Management

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The Colorado River is the major source of surface water in the southwestern United States, providing water and power to at least 25 million people in seven states and Mexico, and making possible extensive irrigated agriculture. The river is highly managed, with two major reservoirs and a number of smaller ones, that together store up to three years of average flow. In 1922, the Colorado River Compact divided flows between the Upper and Lower Basin states, with allocations to Mexico in 1944. The allocations were based on hydrologic data for the first two decades of the 20th century. This period turned out to be not only the wettest in the 20th century, but likely the wettest in over four centuries, as indicated by the first tree-ring based reconstruction of Colorado River streamflow by Stockton and Jacoby in 1976. This reconstruction, as well as recent work, indicates a long-term average flow lower than the gage average, and a broader range of multi-year to multidecadal variability. The recent five-year drought, which reduced Lake Powell reservoir capacity to about 33%, is not unprecedented and was exceeded in severity as recently as the mid-19th century. Droughts have also been more persistent in the past. Stockton and Jacoby's work had important implications for management 30 years ago, but was largely ignored because water supplies were sufficient to meet needs at the time. However, rapid population growth in recent decades, the further development of water supplies in both basins, and a multi-year drought have resulting in the realization that demands now surpass the capacity of the system. The recent drought and its impacts have provided an opportunity for paleoscientists to work collaboratively with water management agencies to address the future management of the Colorado River and other rivers. In particular, drought planning and management is now being addressed, and information from tree-ring reconstructed flows, along with scenarios of future climate, are being considered in management strategies. Bridging the gap between science and water resource management applications is not easy, but in this case, it was greatly facilitated by the three factors: the recent drought, a focus on long-term planning at state and national levels, and water resource personnel receptive to new approaches to water management.